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In the Office Action, claims 1-5 and 26-29 were rejected under 35 U.S.C. § 102(b) on the basis of Bredeweg (4,622,009). Initially, it should be noted that for a prior art reference to anticipate under 35 U.S.C. § 102 every element of the claimed invention must be identically shown in a single reference, see *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990) (Emphasis added.) Those elements must be arranged as in the claim (emphasis added). *Brown v. 3M*, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001).

Bredeweg fails to disclose a variable volume ballast chamber and instead employs a fixed volume ballast chamber. Further, Bredeweg does not have nor does it need a sensor for detecting the position of the piston. Thus, there is not only one but two major elements of the invention as defined by independent claims 1 and 26, which are totally absent from Bredeweg. The Examiner suggests, as to one of the two elements, that the column 7 disclosure in Bredeweg, lines 55-60, inherently discloses the use of a piston sensor and some kind of coding device.

Submitted herewith is the Declaration of Larry O'Brien, Vice President of Research and Development of Leco Corporation, the Assignee of this application and the Bredeweg '009 patent. Mr. O'Brien is familiar with the structure covered by the Bredeweg patent and attests in his Declaration that the fixed volume is achieved by a piston stop which limits the travel, and, therefore, the volume filled by the chamber during each analysis is the same. As a result, the same volume of oxygen is required for every analysis and, for some samples, more oxygen is used than is required to combust the sample. The excess oxygen dilutes the analytes, which can make the results less accurate, and adds additional expense to an analysis. Since the volume is the same for all measurements, the oxygen amount drops out of the calculation of the

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sample concentration. In Bredeweg, therefore, there is no need to measure the position of the piston since it always moves to the stop.

Applicant's invention, on the other hand, provides a much faster and more efficient analysis by only using that amount of volume of a variable volume chamber necessary for complete combustion of the specimen. This also results, as noted in the summary of the invention, in a higher concentration of byproducts of combustion, which allows for more accurate results, which can be obtained more quickly. As noted in the O'Brien Declaration, the Bredeweg patent not only does not inherently disclose a piston distance measurement device, it, in fact, teaches away from any need for such a device. As a result of the two elements of the invention defined by independent claims 1 and 26, both of which are missing in the teaching of the Bredeweg '009 patent, it is submitted that the 35 U.S.C. § 102(b) rejection based upon Bredeweg should be withdrawn.

Claims 1-3 and 26-30 were rejected under 35 U.S.C. § 103 on the combination of Condon (3,698,869) in view of Compton et al. (5,563,339). The requirements for making a *prima facie* case of obviousness are described in MPEP § 2143 as follows:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claims limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488,20 USPQ2d 1438 (Fed. Cir. 1991).

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MPEP § 2143.01 provides further guidance as to what is necessary in showing that there was motivation known in the prior art to modify a reference teaching. Specifically, MPEP § 2143.01, under the heading “Fact That References Can be Combined or Modified is not Sufficient to Establish *Prima Facie* Obviousness”, states:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

and under the heading “Fact That the Claimed Invention is Within the Capabilities of One of Ordinary Skill in the Art is not Sufficient by Itself to Establish *Prima Facie* Obviousness”, states:

A statement that modifications of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art’ at the time the claimed invention was made,’ because the references relied upon teach all aspects of the claimed invention were individually known in the prior art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

The Condon patent, like Bredeweg, provides a fixed volume reservoir 52. Subsequently, the combustion gas is passed to an aliquot sampler (the delay volume 64) and, as seen in Figs. 3A and 3B, to achieve a steady state water concentration with minimum change in water condensation through use of the delay volume 64. Thus, the delay volume serves the same function as the aliquot sampler of Applicant’s invention, which is a distinctly different part of and operates differently than the variable volume ballast chamber of Applicant’s invention. Although the Condon patent suggests that the delay volume 64 could be changed by using a piston-controlled changeable volume cylinder, it does not do so for the purposes of collecting the initial combustion gas after completion of combustion has been detected, as specifically defined in Applicant’s claims. Condon also fails to include a detector for determining when combustion is

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completed and, in fact, only teaches closed combustion where the sample is combusted in a closed static volume of oxygen.

Applicant's system defines a combustion completion detector which allows a flow path of combustion byproducts to be received by the variable volume ballast chamber until combustion has been completed. Thus, Applicant's system defines a dynamic flow of oxygen over the sample during combustion and a real time decision is made as to when combustion is completed, allowing the oxygen stream to be turned off, thereby providing for quicker analysis utilizing less oxygen.

Compton et al. merely teaches use of a volume for determining the vapor pressure of a liquid sample. The system of the present invention is not involved in measuring vapor pressure of samples and instead combusts samples and subsequently determines the sample elemental compositions by utilizing a variable volume ballast chamber to provide samples higher in concentration to increase sensitivity and economy by the reduced oxygen necessary for the analysis. There would be no logical reason to combine the teachings of Condon and Compton et al. apart from Applicant's teachings herein and such attempted hindsight reconstruction of the invention is impermissible. See *Interconnect Planning Corp. v. Feil*, 227 USPQ 543, 551 (Fed. Cir. 1985) where the court noted:

When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself.

It is virtually impossible to conceive how the Compton et al. patent, which doesn't relate to a combustion analyzer, could be considered to supplement the absence in the teaching of Condon of Applicant's variable volume ballast chamber combustion completion detection and piston position

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sensor to render claims 1-3 or 26-30 obvious under 35 U.S.C. § 103. Accordingly, it is respectfully requested that this rejection be reconsidered.

In paragraph 7 of the Office Action, claims 4-9 were also rejected under 35 U.S.C. § 103 on the combination of Condon and Compton et al. as noted above and further in view of Cohrs (4,627,267), which teaches a flow meter calibration used to measure flow rate. The system of Applicant's invention is not dependent on flow rate at all, rather claims 4-9, which are dependent on claim 1, define a system in which combustion completion is detected and during combustion flow rate can vary dramatically with the system not being dependent on flow rate in any manner. The system defined by claims 4-9, thus, pertains to a combustion system with a combustion monitor that determines when combustion is complete and fills a variable volume ballast chamber until completion of combustion, after which the flow, which can vary greatly, is discontinued. In examining the details of dependent claims 4-9 relating to the subsequent handling of the sample in the variable ballast chamber, it should not be confused with the overall invention as defined by claim 1 on which these claims depend and which, as noted above with respect to the rejection on the combination of Condon and Compton et al., is not taught or suggested by the hypothetical combination proposed by the Examiner. Accordingly, reconsideration of the rejection of claims 4-9 on the combination of Condon, Compton et al., and Cohrs is respectfully requested.

Finally, claims 30-35 were rejected under 35 U.S.C. § 103 on the combination of Bredeweg, Compton et al. and Jones (4,527,436). Initially it should be noted that claims 30-35 are dependent on independent claim 26, which was discussed in connection with its rejection on Bredeweg above. Those comments apply equally here. The addition of Jones, which is merely a liquid sampling device, adds nothing to the failure of Bredeweg to provide a variable volume

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ballast chamber for receiving byproducts of combustion once completion of the combustion is detected or detecting the position of the piston. The Compton et al. patent for detecting vapor pressure adds no suggestion of Applicant's invention as defined in claims 30-35. Accordingly, reconsideration of the rejection of claims 30-35 under 35 U.S.C. § 103 is respectfully requested.

It is hoped that, by clarifying to the Examiner the elements defined in the independent claims 1 and 26 of Applicant's invention as originally claimed and explaining the teachings of the prior art relative to these claim limitations, the Examiner will come to the conclusion that Applicant's invention is neither anticipated by nor rendered obvious by any combination of the prior art of record. It is submitted, therefore, that claims 1-9 and 26-35 are in condition for allowance, which action is respectfully solicited.

Respectfully submitted,

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February 3, 2005

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